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Supporting the Learning of Polish and Czech Students by Digital Tools

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Abstract

The article presents the results of exploring the purposes of using digital tools to support student learning at universities. This comprises some identified types of digital tools and the frequency of their use by academic staff, which varies due to their level of digital literacy. Then the collected data is provided concerning the numbers of academic staff using basic electronic communication methods. The above data were collected in Polish and Czech universities and later compared to each other.

The presented study was conducted over the period 2015–2016 within the IRNet project – *International research network for study and development of new tools and methods for advanced pedagogical science in the field of ICT instruments, e-learning and intercultural competences* in Poland (University of Silesia, Faculty of Ethnology and Educational Science in Cieszyn) and the Czech Republic (University of Ostrava, Pedagogical Faculty).

The undertaken research was aimed at recognizing academic teachers' activities concerning their support in university students' learning process.

Keywords: *higher education, academic teachers, supporting the learning process, digital tools, MOOC, comparative study*

Introduction

E-learning is successful today as a method which supports or substitutes the traditional didactic process (t-learning). A growing interest is also observed in e-learning as a scientific discipline (Woolf, 2010; Maloy, Verock-O'Loughlin, Edwards, Woolf, 2016). In the area of didactics in higher education, due attention should be paid to many potentialities of individualizing the education in regard to the diversification of both the pace of work and the implemented contents. Undoubtedly, this turns out to be beneficial for very able learners as well as those with learning difficulties. Thus, e-learning can be treated as a tool which levels out educational chances. While building systems of distance education, higher education institutions face four main problems associated with adjusting the curricula and the educational processes to the requirements of e-learning systems, to activating university student environments, and to technological requirements and problems with building an e-learning system. What is also worth attention is a change in the teacher's role in the educational process – drifting away from the position of a source of knowledge (learners can obtain the latest information from websites, coursebooks, dictionaries, multimedia encyclopaedias, chats and fora) in favour of the position of a person who indicates the way to knowledge and supports learners in the acquisition of knowledge on their own by, e.g., sharing appropriate programs and teaching the skills of applying them (Moore, Anderson, 2003; Midgley, 2016; Malach, Kostolánová, Chmura, Ogrodzka-Mazur, Szafrąńska-Gajdzica 2016; Juszczak, Kim, 2016; Ogrodzka-Mazur, Szafrąńska, Malach, Chmura, 2017).

Online learning at universities

In the context of exploring the support of student learning by digital tools, it seems necessary to mention the annual reports on online education in the USA. The 2010 report (Allen and Seaman, 2010) collected data from 2,500 dormitories and universities (i.e., from 57.3% of all tertiary institutions). It provides the classification of university courses from the point of view of their didactic interpretation – the applied methods, which were created on the basis of the comparison of classification approaches of the interviewed institutions. The traditional type of courses has a zero share of the online presented content. The web facilitated course can have a 1–29% share of the online presented content. The

blended/hybrid¹ course has a 30–79% share. The online course has a share higher than 80% while it has no share of direct instruction. 63% of all the interviewed institutions consider online education an integral part of their long-term strategy.

5.6 million students (nearly 30% of all university students and this number continues to rise) studied at least one online course in the year the research took place. The number of the authorities of academic institutions who consider the study results of online education to be the same or better than the results of traditional education is also rising (from 57% in 2003 to 66% in 2010). More than 75% of public school authorities state that online education is the same or better than traditional (face-to-face) education. 75% of the institutions state that the economic decline increases the requirements for online courses and programs.

The 2011 report (Allen and Seaman, 2011) shows only small shifts concerning the application of online education. The number of university students who study at least one online course increased to 6.1 million, which is 31% of all students. The number of the authorities of academic institutions who consider the study results of online education to be the same or better than the results of traditional education has increased to 67%. The academic authorities of the institutions with online offers have a much more favorable opinion on the learning outcomes of online courses than those of the institutions with no online courses or programs. It is interesting that over the past eight years the acceptance of online education almost has not changed and that it is different at different types of institutions in spite of the growing number of online programs and courses. Fewer than one-third of leading academic scholars believe that their department accepts the value and justness of online education. The departments profusely support the development of online education by combining mentoring and optional courses, which ensures pleasant and successful realization of online courses.

Omitting the three following reports, the 2015 report (Allen and Seaman, 2015) includes the summary of the incorporation or planning of Massive Open Online Courses (MOOCs), which already exist in 8% of institutions. The percentages of higher education institutions that currently have a MOOC are diversified. Many institutions (39.9%) report they are still undecided about MOOCs, while the single largest group (46.5%) says they have no plans for a MOOC. Only 16.3% of academic authorities believe that MOOCs represent a sustainable method of offering online courses (28.3% in 2012). Decreasing numbers of authorities see

¹ Blended learning may fall into four basic models: the rotation model (with variants: rotation, lab rotation, flipped rotation and individual rotation), flex model, a la carte model and enriched virtual model (cf., Powell et al., 2015).

MOOCs as a way for institutions to learn about online education: 27.9% this year, 49.8% and 44.0% in the last two years. The acceptance of online education has decreased to 28%, this slightly declining trend is permanent. The report once again deals with a question whether or not students require more discipline to complete online courses. Academic authorities have been consistent in their belief that “students need more discipline to succeed in an online course than in a face-to-face course.” In 2005, the majority of respondents (64.7%) agreed with this statement. By 2013, the proportion had grown to 68.9%, and it now stands at 68.3% for the current 2014 results.

Moreover, the report pursues the identification of the developmental barriers of online education. It argues that “when online education first arrived on the scene, one of the hopes was that teaching with technology would be more efficient than current methods”. Perhaps faculties could teach more students with improved quality by taking advantage of the new technology. This has not proven to be the case. Academic authorities have continued to report that it takes more time and effort for faculty staff to teach an online course than to teach a corresponding face-to-face course (Allen and Seaman, 2015, p. 26). Unfortunately, the majority of leaders report that the additional effort required to deliver an online course represents a barrier for online instruction. New technologies, the academic experience with teaching online, and expanded and improved institutional support services have not resulted in reducing this problem. The level of concern in 2014, with 78.0% reporting it as an “important” or “very important” hindrance for the adoption of online instruction, is higher than it was in 2008 (76.3%).

It seems that the technical support for university teachers in using online education alone cannot limit the perception of this way of education as more demanding in comparison to the traditional way, which can result in the teachers’ lack of motivation concerning online education and its application. Moreover, the report also showed considerable diversification concerning the perception of the term Open Educational Resources (OER), which is caused by the lack of terminological uniformity. The report mentions the findings of the previous reports (Allen and Seaman, 2012), which led to two crucial conclusions:

- “Nearly two-thirds of all chief academic officers agreed that open educational resources have the potential to reduce costs for their institution.
- There was wide agreement among academic authorities that open educational resources will save time in the development of new courses” (Allen and Seaman, 2015, p. 28).

On the other hand, the result of the faculty awareness of open educational resources is surprising. “A bit more than one third claimed to have some level of

awareness. Just over 5% reported that they were very aware (“I am very aware of OER and know how they can be used in the classroom”), with around three times that many (15.2%) saying that they were aware (“I am aware of OER and some cases of their use”). An additional 13.8% of the faculty reported that they were only moderately aware (“I am moderately aware of OER but I am not sure how they can be used”). This left nearly two thirds of the faculty reporting that they were generally unaware of OER (“I am not aware of OER” or “I have heard of OER, but don’t know much about them”)” (Allen and Seaman, 2015, p. 29).

Another remarkable issue, which was part of the latest report, was the retention of students in online courses. “There is a growing concern among academic authorities about the issue of student retention. A total of 44.6% of chief academic officers reported that they agreed that retaining students was a greater problem for online courses than for face-to-face courses. This compares to rates of 40.6% in 2013, 28.4% in 2009 and 27.2% in 2004 for the same question” (Allen and Seaman, 2015, p. 24).

The authors of the report explain the issue by stating that students choose online courses because they are not able to attend traditional courses because of work, family or other commitments. The essential question, however, can be more complex: “If students are more likely to drop out of an online course because of work or family commitments, does that reflect on the nature of the course or the nature of the student?” (Allen and Seaman, 2015, p. 24). In any case, two thirds of all academic authorities continue to regard retention of online students as a critical issue for the future of online education.

The research results of Cegarra-Navarro and Rodríguez (2012) suggest that the use of e-learning by a university may depend on how university administrators handle the Internet, Groupware and Collective Systems. Not only will the Internet make universities more transparent and provide access to a wider range of information and services, but when integrated with Groupware and Collective systems, it will also create opportunities for partnership and collaboration between students and teachers. Limniou, Haldcroft and Holmes (2015) have shown that the Internet, as a medium for social activities, opens up entirely new features in the academic society. However, academics should understand how people learn and how people can be facilitated to learn through ICT in order to create a pedagogically valuable virtual course/community. Socio-emotional and informational motivations mainly lead research students to the involvement in a virtual community in order to discuss with others and/or collect information about common interests. University staff can collaborate with students in a flexible digital environment and consciously empower them.

The research into digital tools to support student learning

The main research problem was the lack of information concerning the purpose of using digital tools to support students' learning at universities, the frequency of their use, the dependence on the degree of digital literacy of academics and the number of academics who apply the basic methods of electronic communication.

The objective of this descriptive research was to find out:

- what are the aims of supporting student learning by the use of digital tools and how Polish and Czech teachers differ,
- what is the frequency of use of certain types of digital tools (programs), depending on the level of digital literacy of academics and universities,
- what percentage of academics of both universities use individual basic instruments of electronic communication with students.

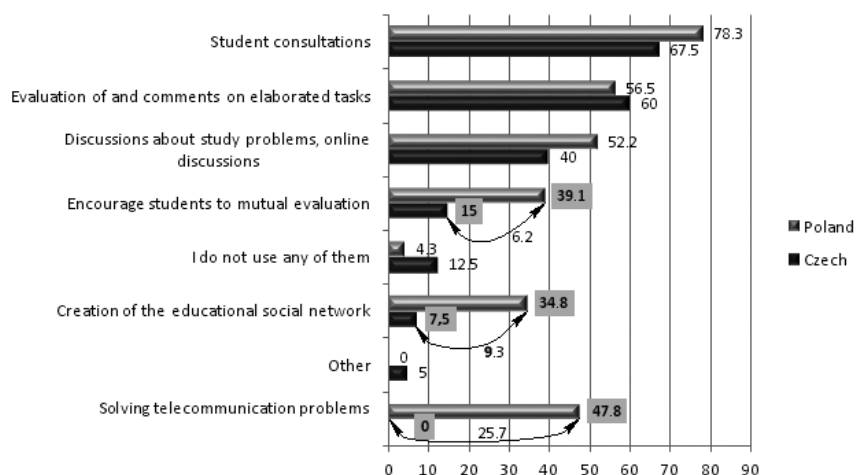
Data collection

The data (obtained from the research questionnaire for academic scholars) was collected at the end of the 2015/16 academic year. The research sample consisted of 46 academic teachers of the Faculty of Ethnology and Educational Science of the University of Silesia, including 30.4% of full-time professors, 39.2% of assistant professors and 30.4% of assistants. The research also involved 40 university teachers working at the Pedagogical Faculty of the University of Ostrava. The majority of the respondents were assistant professors (72.5%), the remaining ones were doctors with habilitation and full-time professors.

Research results

The examined academic teachers in Poland and the Czech Republic indicated the most important goals of using network communication in their didactic activities. The comparison of the answers provided by the Czech scholars with the answers of the Polish university staff concerning the goals which can be achieved owing to the use of digital tools as well as the conducted statistical analyses revealed significant differences in the following responses:

- encouraging students for mutual evaluation ($\chi^2 = 6.2$; $p < 0.05$ and $\Phi = 0.27$),
- creation of the educational social network ($\chi^2 = 9.3$; $p < 0.05$ and $\Phi = 0.33$),
- solving telecommunication problems ($\chi^2 = 25.7$; $p < 0.05$; $\Phi = 0.55$).



* In all figures and tables, statistically significant differences are marked in bold

Figure 1. The purpose of using digital tools to promote learning

Source: own elaboration

The respondents were asked to select those of the eight proposed goals (purposes) that – according to them – could be achieved through the use of digital tools. They were allowed to choose as many goals (purposes) as they wished. The data in Figure 1, respectively show that 67.5% of all the teachers are convinced that the digital tools are suitable for student consultations, 60% of them think that they should be used for evaluation of and comments on students' tasks and 40% think they should be used in discussions concerning study problems, preferably in online mode.

The examined academic teachers assessed the programs applied in didactic activity. Using a five-point scale, the respondents were asked to evaluate the use of the four presented computer programs, which differed in the degree of commonness or specialization for university education (1 means less often and 5 means very often). The data presented in Figure 2 show that the more specialized a program is, the less often it is used. In other words, non-specialized office programs are used very often while programs managing the educational process and the choice of its content are used more rarely.

When comparing the evaluations of the programs applied in didactic activity by the scholars from Ostrava and Cieszyn, it can be noticed that the academic teachers from Poland evaluate significantly higher:

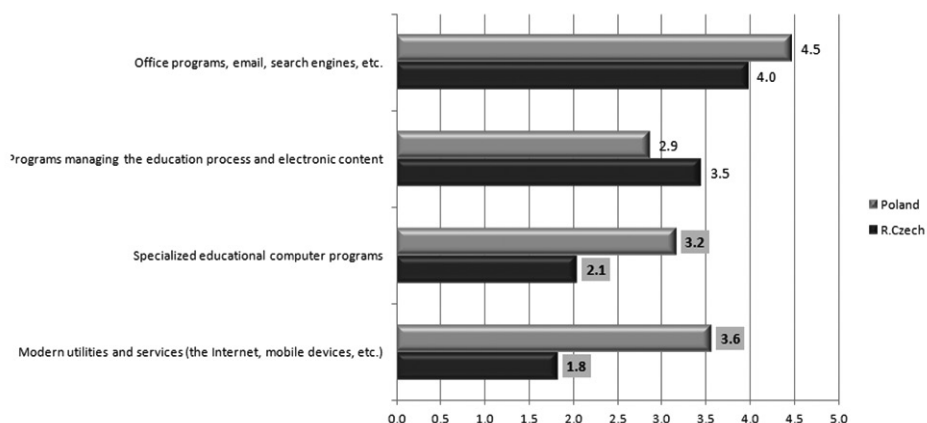


Figure 2. Frequency of teachers' use of particular groups of programs in education (factor – environment)

Source: own elaboration

- specialized computer programs for teaching (Mann-Whitney U test: $Z = 3.04$; $p = 0.002$),
- modern gadgets and services (Mann-Whitney U test: $Z = 5.07$; $p = 0.0000$).

What was also compared were the evaluations of programs by the respondents in Ostrava and Cieszyn and ICT competences as their determinant. Both in the Polish and Czech environment, in each case, the academic teachers who considered themselves “advanced users” evaluated the software used in education significantly higher (Figures 3 and 4).

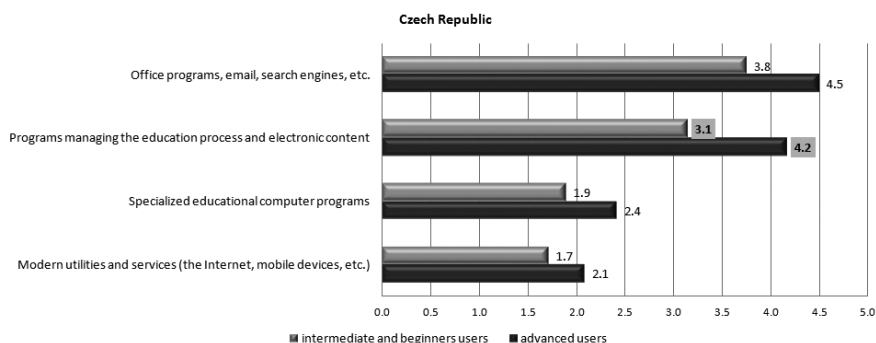


Figure 3. Frequency of Czech teachers' use of particular groups of programs in education (factor – ICT competence)

Source: own elaboration

Significant differences in the evaluations of the Czech scholars were confirmed in the analyses only in the category:

- programs managing the educational process and electronic content (Mann-Whitney U test: $Z = 2.04$; $p = 0.041$).

The evaluations of the Polish scholars differ significantly in the following more often:

- office programs, email, search engines, etc. (Mann-Whitney U test: $Z = 1.98$; $p = 0.048$),
- specialized educational computer programs (Mann-Whitney U test: $Z = 3.3$; $p = 0.001$),
- modern utilities and services (Mann-Whitney U test: $Z = 2.81$; $p = 0.005$).

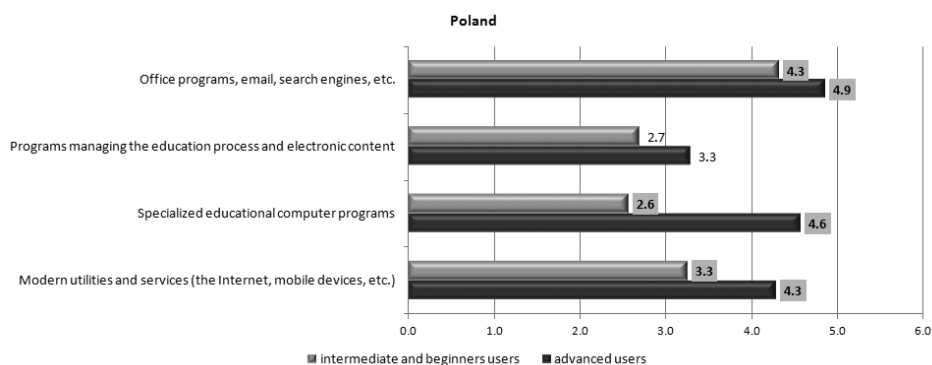


Figure 4. Frequency of Polish teachers' use of particular groups of programs in education (factor – ICT competence)

Source: own elaboration

Moreover, the teachers who consider themselves advanced users evaluate the programs applied in the didactic process significantly higher.

Table 4 presents the research results for which the conducted analyses confirmed significant differences in regard to the environment and ICT competences.

The academic teachers were also asked to indicate the communication networks which they use in the process of teaching their students. The respondents could choose more than one of the eight possible answers. The results are summarized Figure 5.

When communicating with their students, the Czech university teachers prefer emails and relevant LMS tools (85% of all the teachers and 55.7% of all the answers). 20% of all the teachers use media channels and 12.5% of all the teachers

Table 4. Frequency of teachers' use of particular groups of programs in education
(factor – ICT competence and environment)

ICT competences		Office programs, email, search engines, etc.		Programs managing the educational process and electronic content		Specialized educational computer programs		Modern utilities and services (the Internet, mobile devices, etc.)	
		Czech R.	Poland	Czech R.	Poland	Czech R.	Poland	Czech R.	Poland
Advanced users	Mean	4.5	4.9	4.2	3.3	2.4	4.6	2.1	4.3
	Std. Deviation	1.000	0.363	1.267	1.729	1.564	0.514	1.505	1.437
Beginners or intermediate users	Mean	3.8	4.3	3.1	2.7	1.9	2.6	1.7	3.3
	Std. Deviation	1.481	1.061	1.508	1.635	1.315	1.759	0.937	1.368
Sig. (M.-W. test)		Z = 1.98 p = 0.048		Z = 2.04 p = 0.041		Z = 3.3 p = 0.001		Z = 2.81 p = 0.005	
Total	Mean	4.0	4.5	3.5	2.9	2.1	3.2	1.8	3.6
	Std. Deviation	1.387	1.006	1.501	1.792	1.395	1.885	1.130	1.563
Sig. (M.-W. test)		Z = 3.04; p = 0.002 Z = 5.07; p = 0.000							

Source: own elaboration

use internet discussions. Every eighth teacher, however, has not used any of the electronic communication instruments yet. Four teachers use one of the social networks and one teacher uses teleconferences for communication with students.

The academic teachers from Cieszyn evaluate their use of communication networks in a different way. Only the answers “messages (e-mail, instant messaging, LMS, etc.)” and “other” are similar to the evaluations formulated by their colleagues from Ostrava. The other responses differ and statistical analyses confirm the significance of these differences.

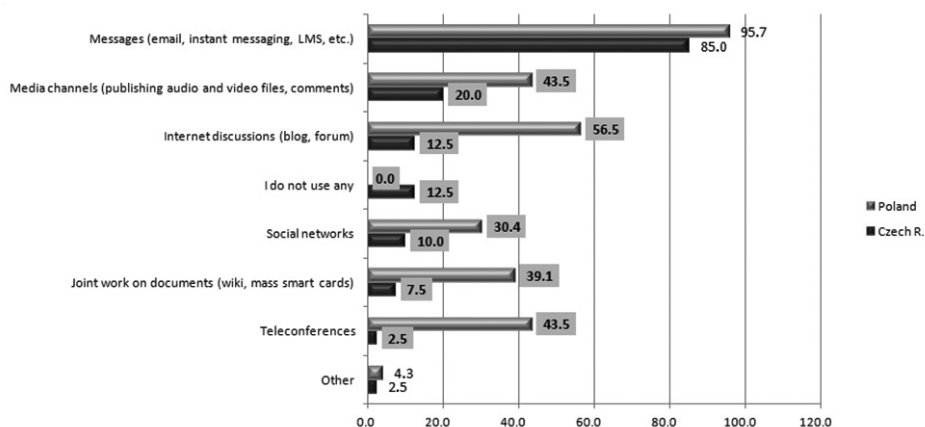


Figure 5. Electronic communication instruments used in education (factor – environment)

Source: own elaboration

They have the following values (factor – environment):

- media channels (publishing audio and video files, comments) – 43.5% ($\chi^2 = 5.4$; $p = 0.02$ and $\Phi = 0.25$),
- internet discussions (blog, forum) – 56.5% ($\chi^2 = 18.0$; $p = 0.000$ and $\Phi = 0.46$),
- I do not use any – 0.0% ($\chi^2 = 6.1$; $p = 0.02$ and $\Phi = 0.27$),
- social networks – 30.4% ($\chi^2 = 5.4$; $p = 0.02$ and $\Phi = 0.25$),
- joint work on documents (wiki, mass smart cards) – 39.1% ($\chi^2 = 11.6$; $p = 0.0005$ and $\Phi = 0.37$),
- teleconferences – 43.5% ($\chi^2 = 19.5$; $p = 0.000$ and $\Phi = 0.48$).

The obtained research results seem to confirm that the scholars from Cieszyn use all types of communication networks in their didactic process and apply them

significantly more often than the academic teachers from Ostrava. This may be determined by the development of the integrated information system of university management, which the respondents use and which, in this way, improves the quality of students' education.

Conclusion

Due to its potentialities and the elimination of territorial barriers, e-learning is a system which increases educational chances of all participants in the educational process. The numerous advantages of e-learning result in its growing use. The possibility to adjust the pace of knowledge acquisition and to decide about the time of undertaking education, as well as using various forms of presentation enhance the effectiveness of learning. Moreover, the time and money saved due to the lack of necessity to travel to the places where classes take place help to strengthen the motivation to learning on one's own. The use of e-learning is particularly beneficial in the context of the functioning of higher education institutions – the possibility to organize classes for all students without their physical gathering in a particular place; reduced costs; saving the staff's time; the way of passing knowledge which allows for using the resources in any way by its recipients; easy control over the progress of students' knowledge acquisition – are just a few reasons why this type of education gains popularity.

The comparative studies carried out in Poland and the Czech Republic seem to confirm differences in the way in which academic teachers evaluate the potentialities of technologies and in which they apply them in educational practice. The effective use of e-learning and modern ICT in universities largely depends on the familiarization with appropriate methodology and knowledge (and the ways of preparing for its application) concerning the use of computers and information technologies. Educators' attitude to teaching in this mode is equally important. In this situation, special significance should be attributed to preparing and implementing programs which support the education and training of academic teachers in the field of applying ICT and e-learning in educational practice. What might serve as an example of good practice are the undertakings of Eugenia Smyrnowa-Trybulska at the Faculty of Ethnology and Educational Science in Cieszyn (University of Silesia) (2016). Among other things, they comprise shaping competences in the field of designing, conducting, and evaluating e-learning courses, exemplified by the Moodle system.

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